

**APPENDIX B**  
**PHOTOS**

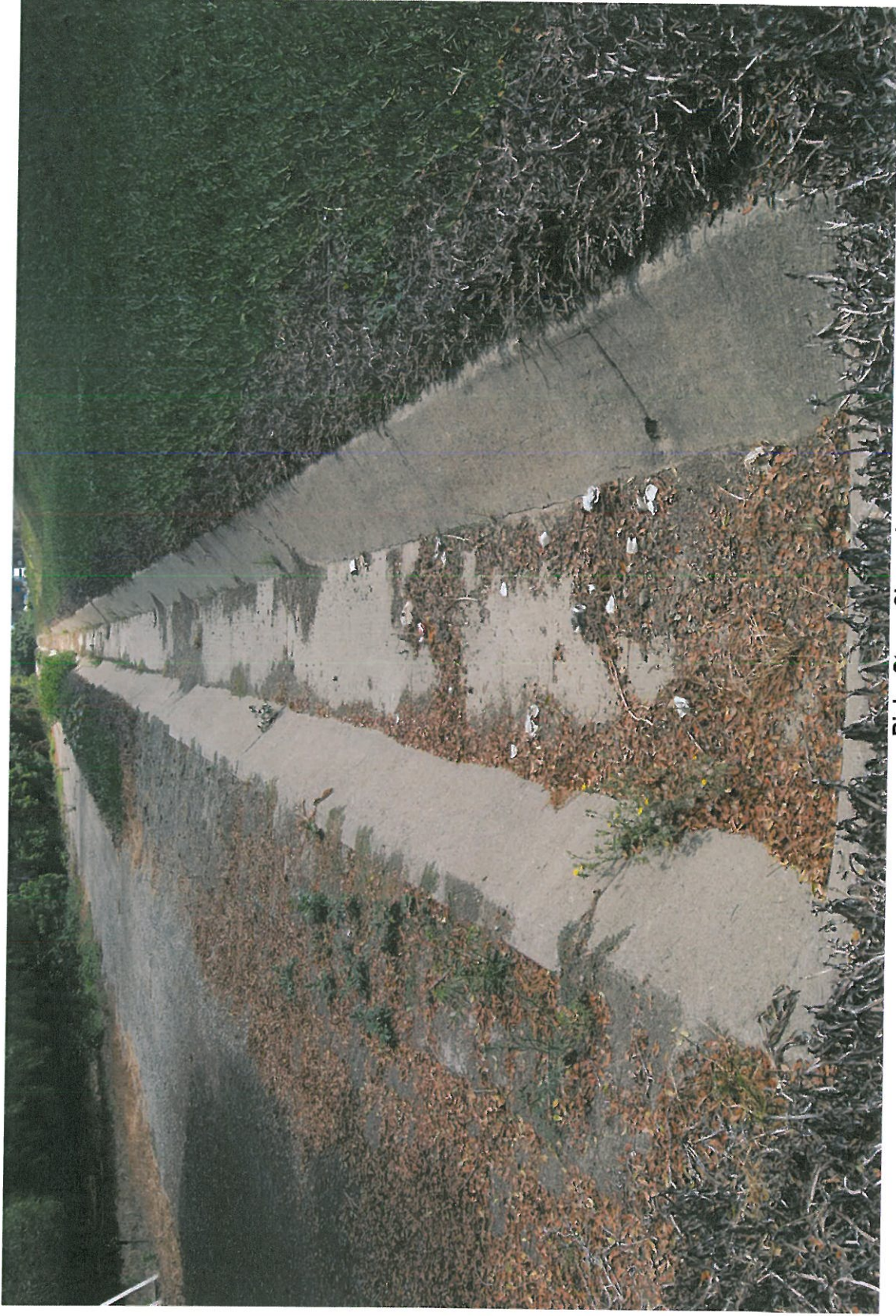
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Montecito Storm Channel

**Photo Date:** July 23, 2009

**Direction:** Picture taken facing southwest, from east of I-405.



**Bixby Storm Channel**

**Photo Date:** July 29, 2009

**Direction:** Picture taken facing south and east of I-405



Bixby Storm Channel

**Photo Date:** August 4, 2009

**Direction:** Picture taken facing west and north of I-405.



Federal Storm Channel

**Photo Date:** Google 2009

**Direction:** Picture taken facing northeast from south of I-405.



Federal Storm Channel

**Photo Date:** July 23, 2009

**Direction:** Picture taken facing east from south of I-405.



**Bolsa Chica Channel**

**Photo Date:** April 28, 2010

**Direction:** Picture taken facing North, from south of I-405.



Milan Storm Drain

**Photo Date:** April 28, 2010

**Direction:** Picture taken facing north, from south of I-405.



Anaheim Barber Channel

**Photo Date:** July 23, 2009

**Direction:** Picture taken facing southwest, from north of I-405.



Westminster Channel

**Photo Date:** July 27, 2009

**Direction:** Picture taken facing Northeast (Northwest of the intersection Bolsa Ave/Goldenwest St.)



Edinger Storm Channel

**Photo Date:** August 4, 2009

**Direction:** Picture taken facing southeast, from north of I-405.



Newland Storm Channel

**Photo Date:** August 4, 2009

**Direction:** Picture taken facing south, from north of I-405.



Newland Storm Channel

**Photo Date:** April 28, 2010

**Direction:** Picture taken facing north, from north of I-405.



East Garden Grove Wintersburg Channel

**Photo Date:** August 4, 2009

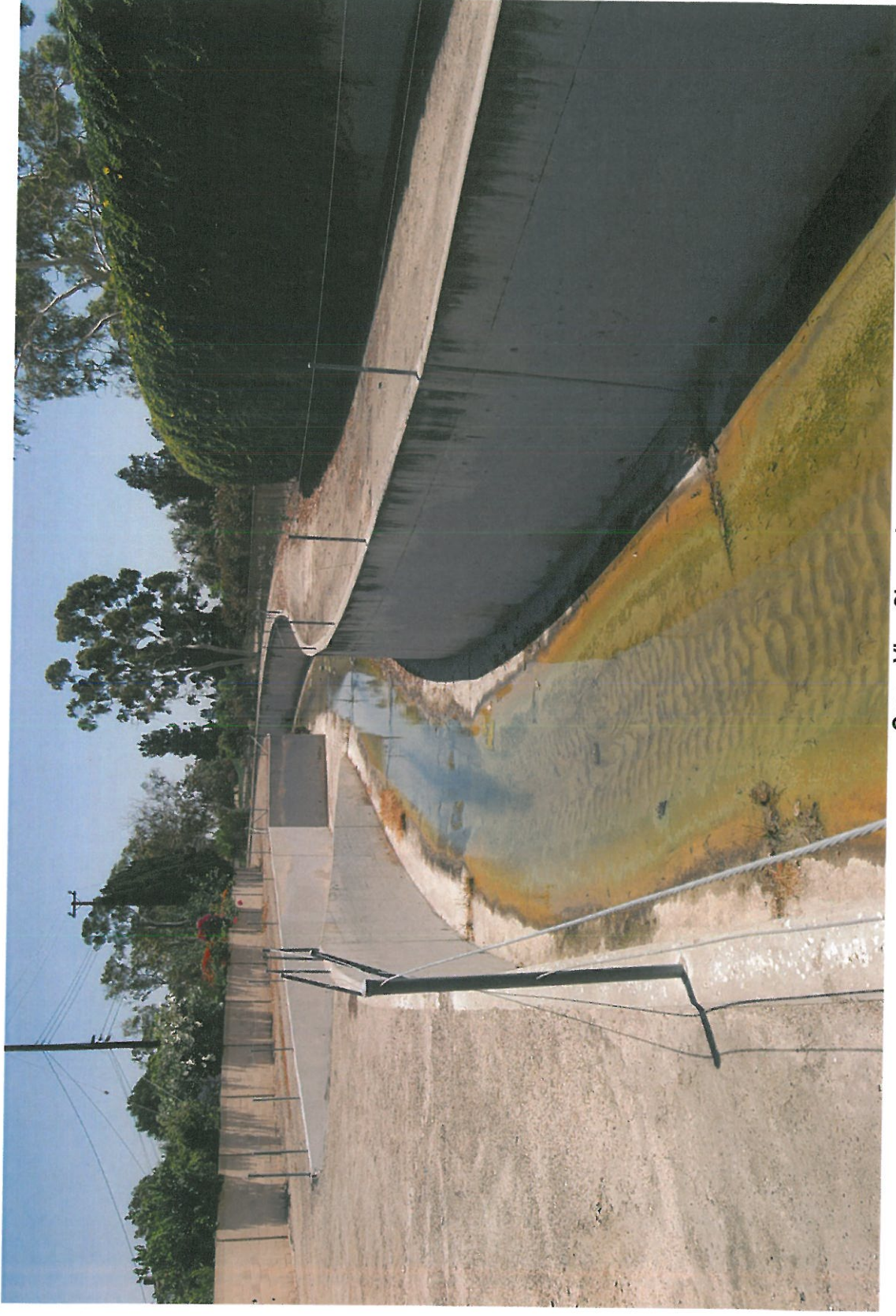
**Direction:** Picture taken facing southeast, north of I-405.



East Garden Grove Wintersburg Channel

**Photo Date:** August 4, 2009

**Direction:** Picture taken facing northeast, south of I-405.



Ocean View Channel

**Photo Date:** July 28, 2009

**Direction:** Picture taken facing southeast, from north of I-405.



Fountain Valley Channel

**Photo Date:** July 28, 2009

**Direction:** Picture taken facing southwest, from south of I-405.



Santa Ana River

**Photo Date:** July 29, 2009

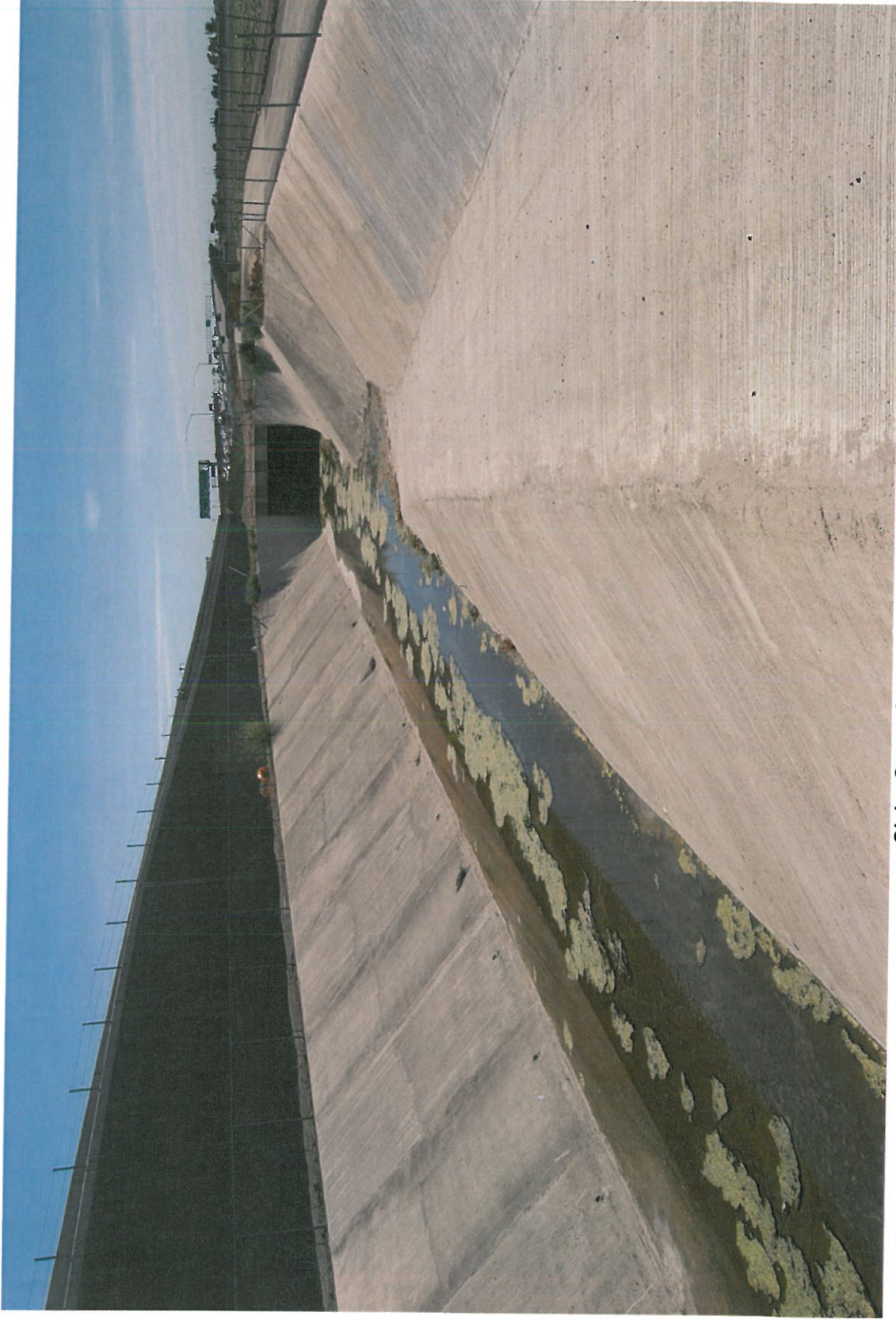
**Direction:** Picture taken facing northwest, from north of I-405. Drains from northeast to southwest and towards the Pacific Ocean.



Greenville Banning Channel

**Photo Date:** April 28, 2010

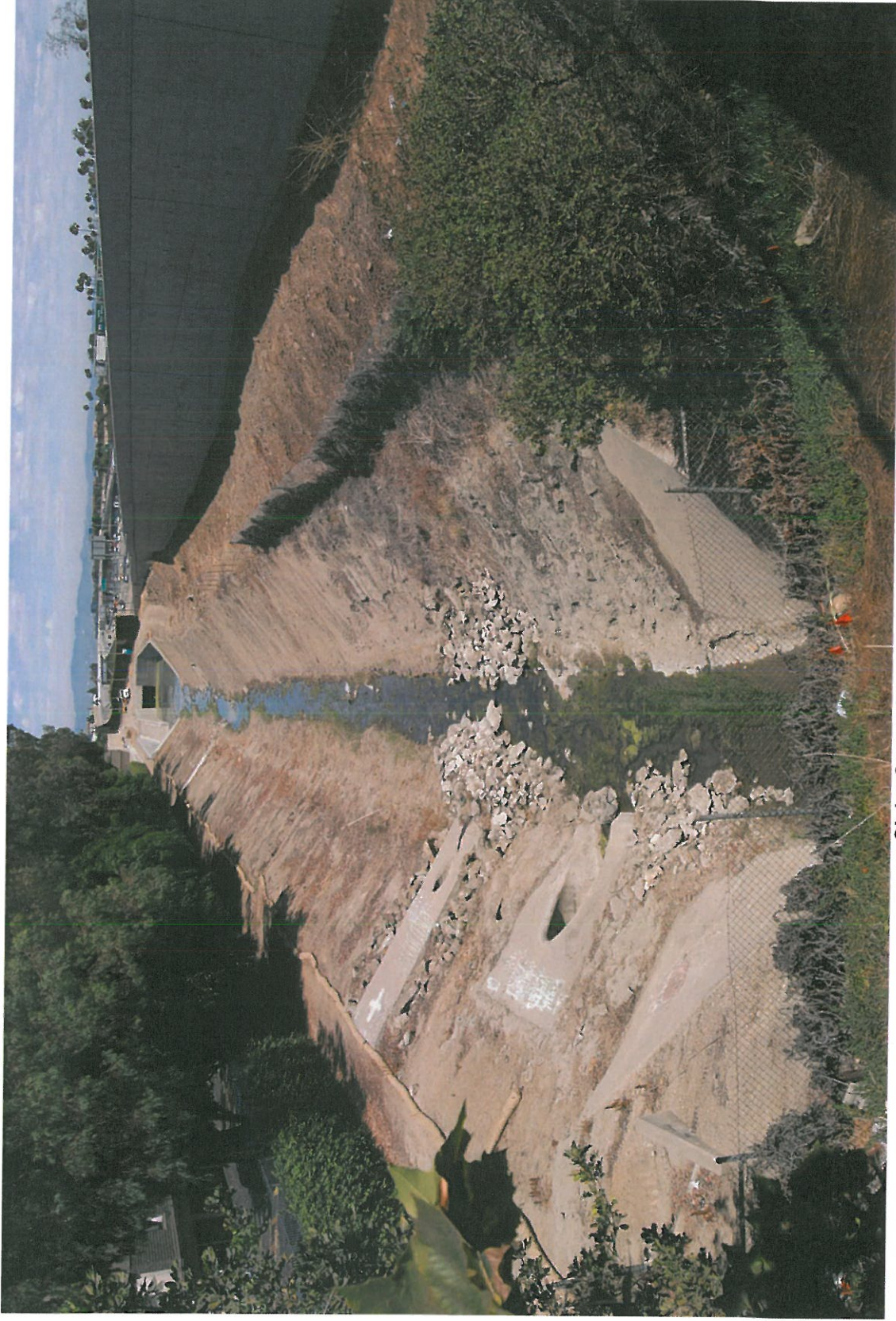
**Direction:** Picture taken facing southwest, from north of I-405.



Gisler Storm Channel, west of Fairview Rd.

**Photo Date:** April 4, 2009

**Direction:** Picture taken facing west, from north of I-405.



Gisler Storm Channel, east of Fairview Rd.

**Photo Date:** April 4, 2009

**Direction:** Picture taken facing east, from north of I-405.



Delhi Storm Channel

**Photo Date:** April 27, 2010

**Direction:** Picture taken facing South, from north of I-405.



Delhi Storm Channel

**Photo Date:** April 27, 2010

**Description:** Picture taken facing North, from south of I-405.

**APPENDIX C**  
**PROPOSED ROADWAY IMPROVEMENTS**  
**ADJACENT TO FLOODPLAINS**

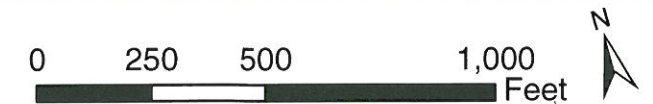
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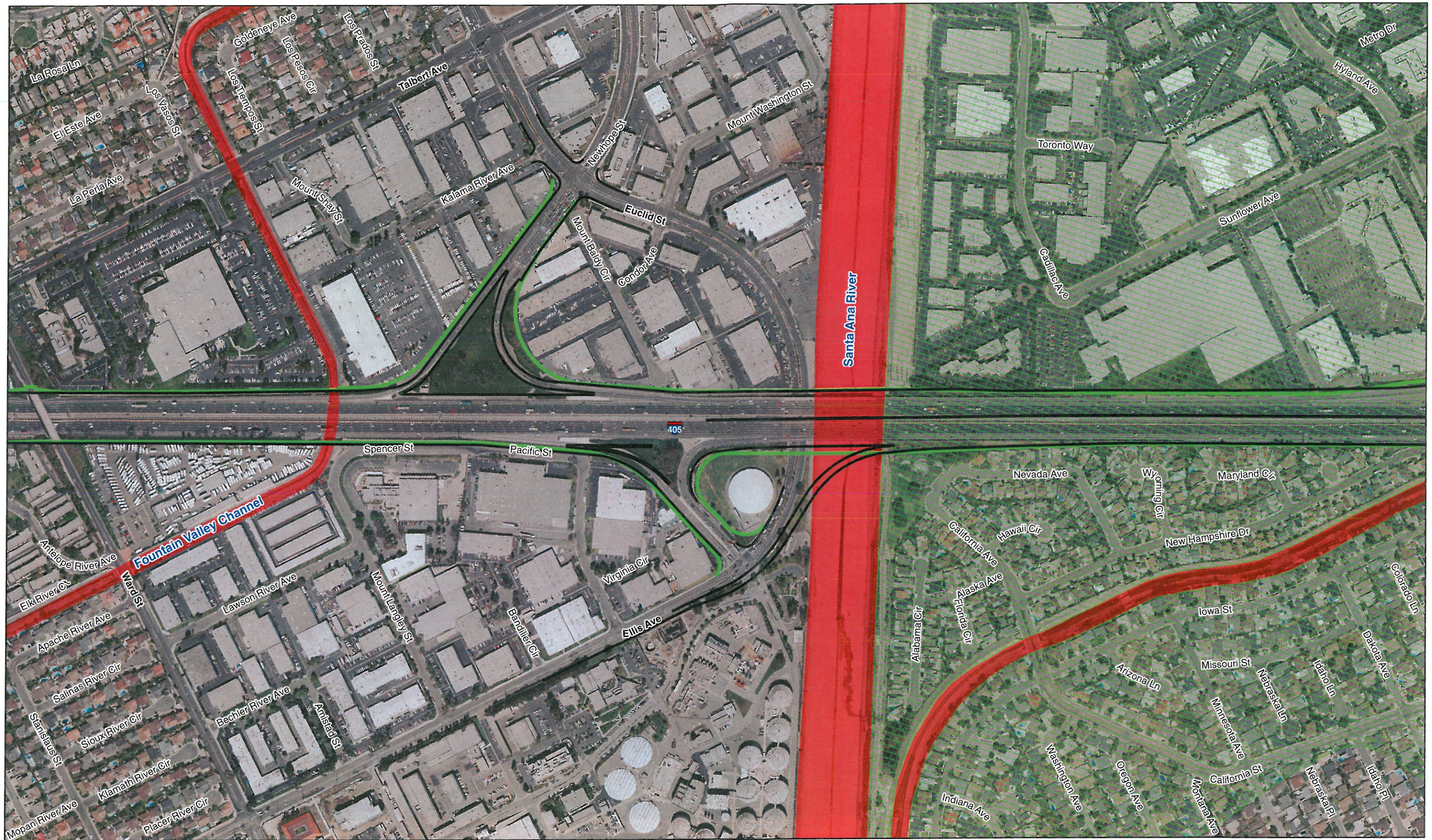


— Proposed New Edge of Roadway Flood Hazard Zones  
 — Right-of-Way

A AE	AH AO D	OPEN WATER X X PROTECTED BY LEVEE
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Floodplain Map  
 1 of 9





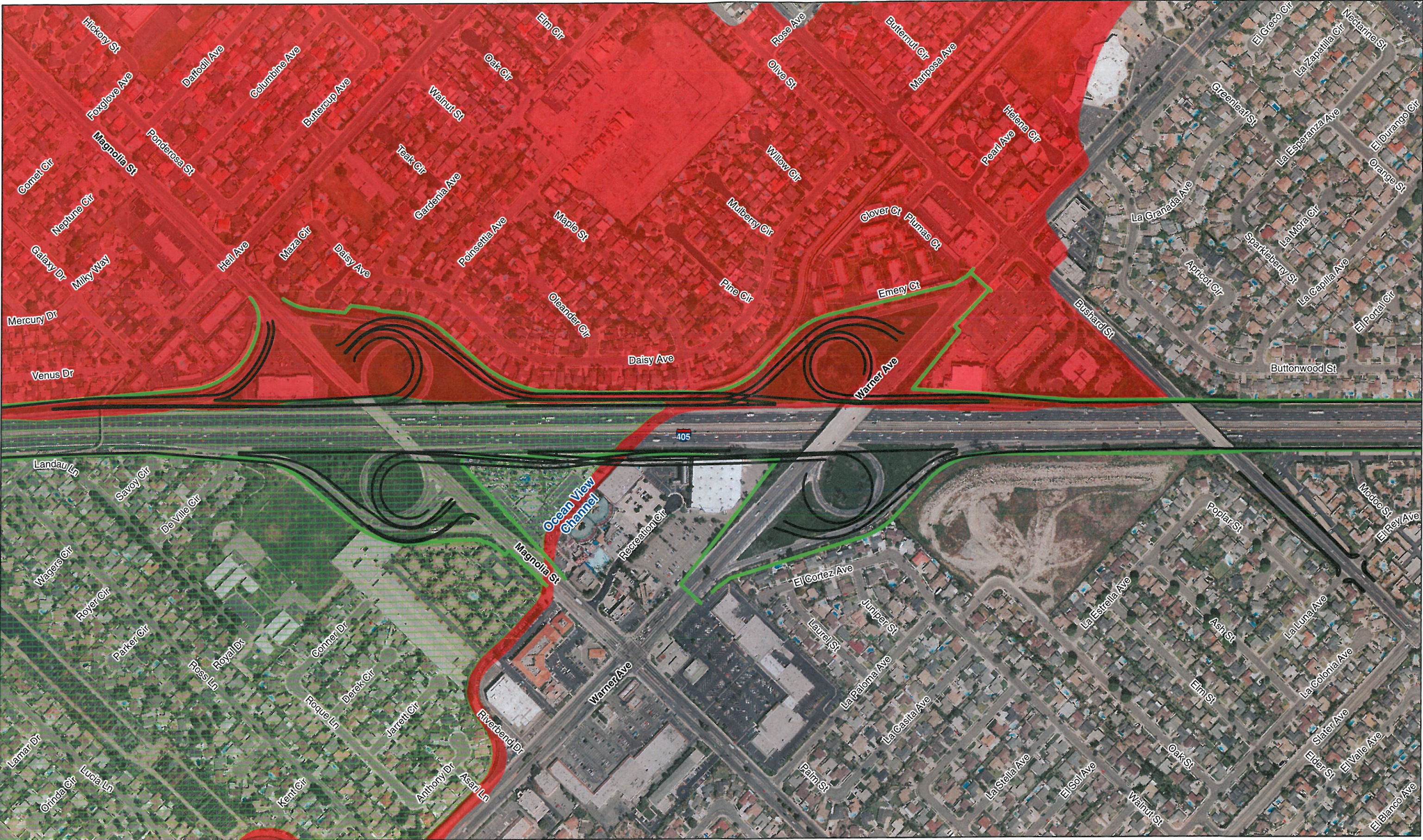
— Proposed New Edge of Roadway  
 — Right-of-Way

**Flood Hazard Zones**  
 A  
 AE  
 AH  
 AO  
 D  
 X  
 X PROTECTED BY LEVEE

**Floodplain Map**  
**2 of 9**

0 250 500 1,000  
 Feet





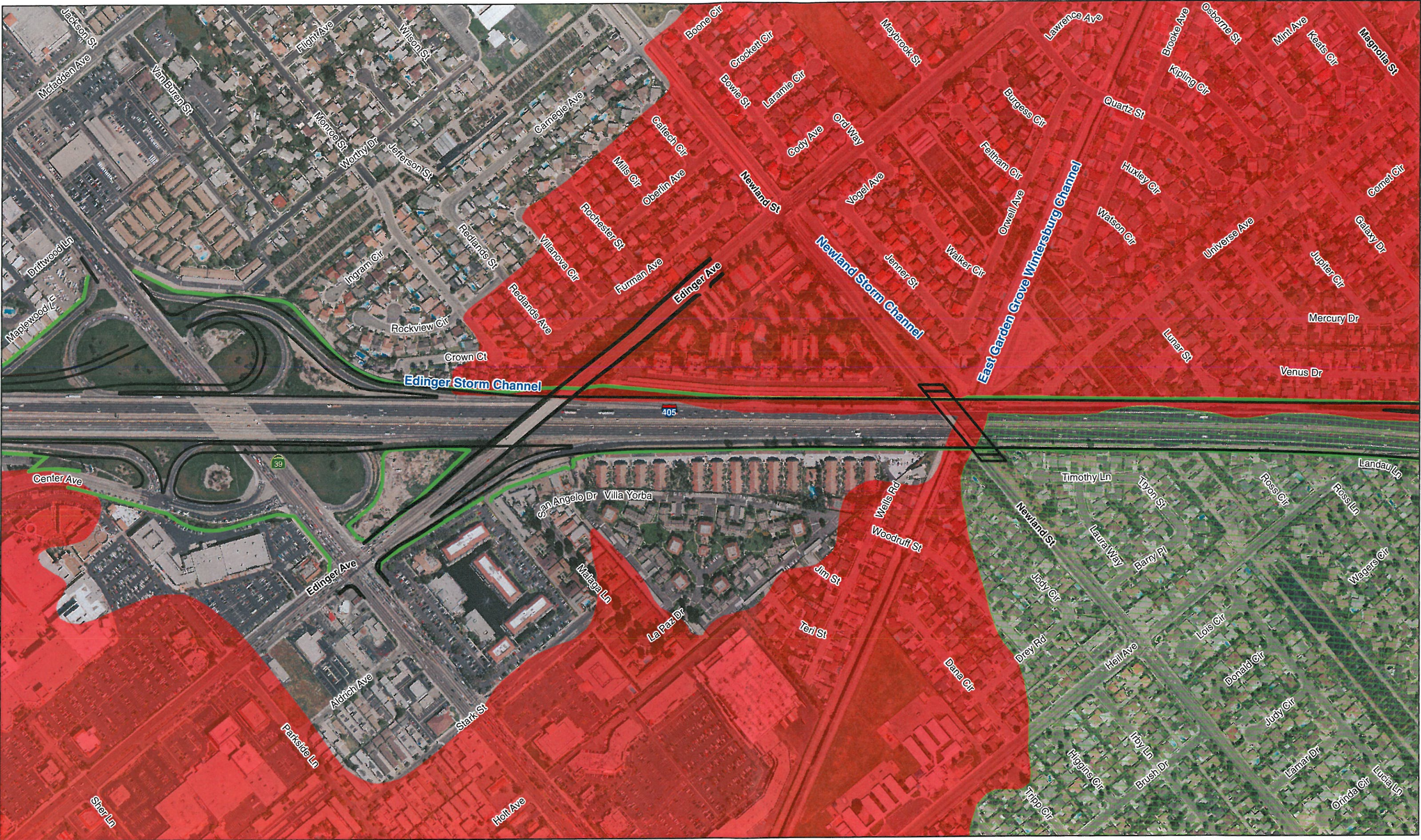
— Proposed New Edge of Roadway  
— Right-of-Way

**Flood Hazard Zones**

A	AO	OPEN WATER
AE	D	X
		X PROTECTED BY LEVEE

**Floodplain Map**  
**3 of 9**



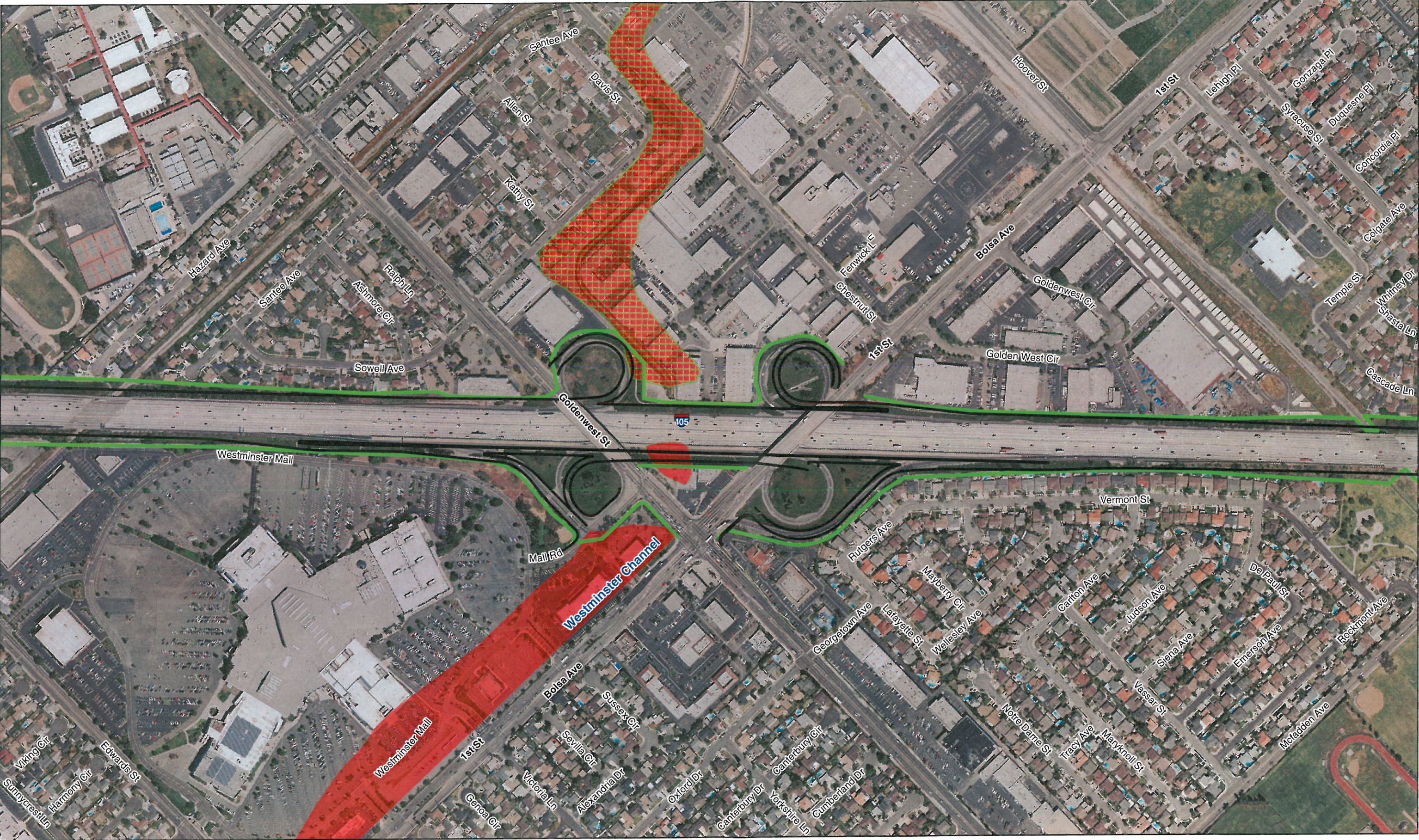


— Proposed New Edge of Roadway  
— Right-of-Way

A	AH	OPEN WATER
AE	AO	X
	D	X PROTECTED BY LEVEE

Floodplain Map  
4 of 9



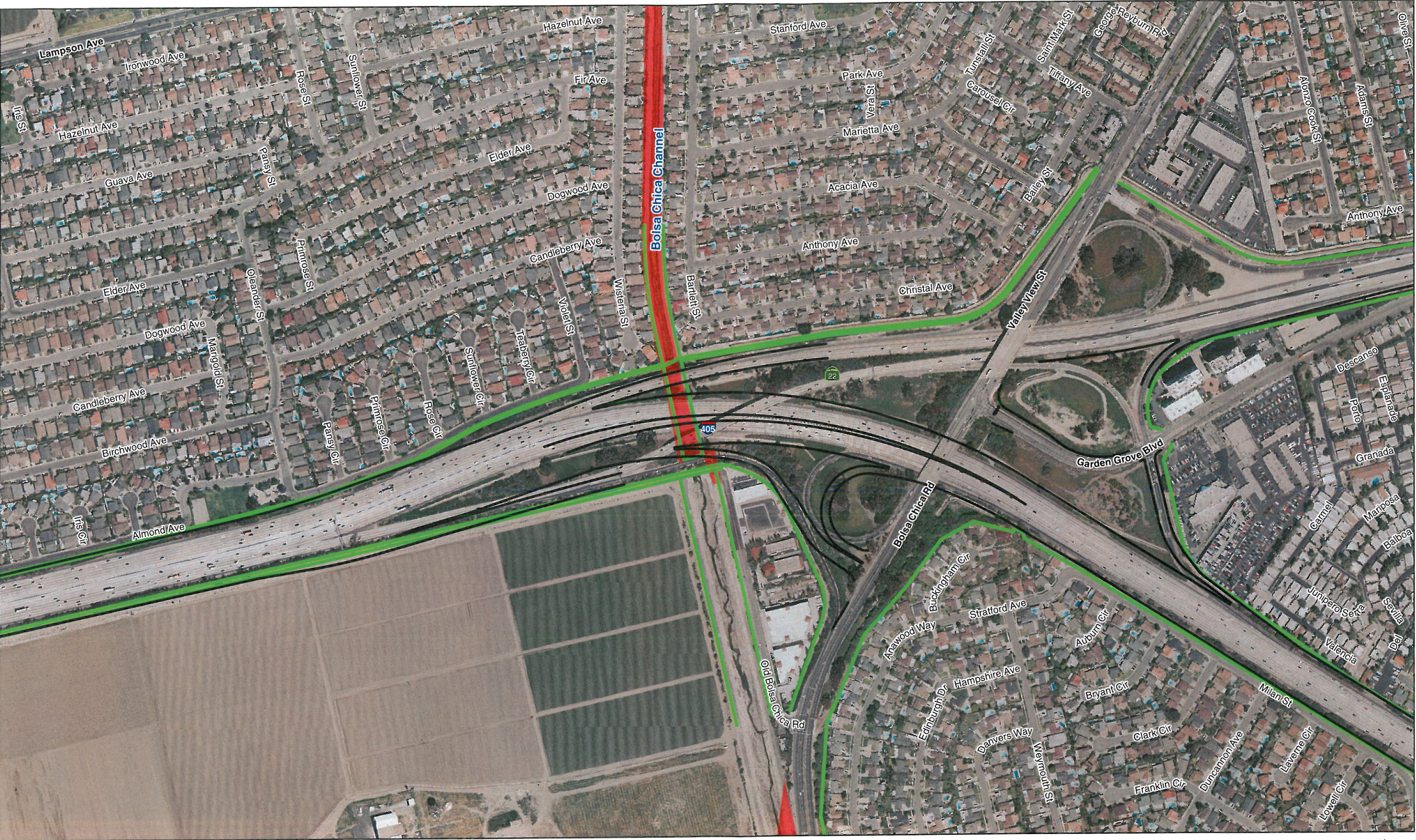


— Proposed New Edge of Roadway  
— Right-of-Way

<b>Flood Hazard Zones</b>	AH	OPEN WATER
A	AO	X
AE	D	X PROTECTED BY LEVEE







— Proposed New Edge of Roadway

— Right-of-Way

A

AE

— Flood Hazard Zones

AO

D

X

X PROTECTED BY LEVEE

— OPEN WATER

X

Floodplain Map  
7 of 9

02505001,000

Feet

N

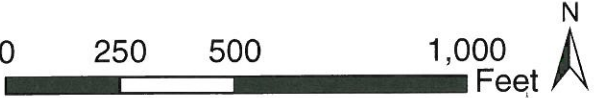


— Proposed New Edge of Roadway  
— Right-of-Way

**Flood Hazard Zones**

A	AH	OPEN WATER
AE	AO	X
	D	X PROTECTED BY LEVEE

**Floodplain Map**  
8 of 9





— Proposed New Edge of Roadway  
— Right-of-Way

**Flood Hazard Zones**

A	AH	OPEN WATER
AE	AO	X
	D	X PROTECTED BY LEVEE

**Floodplain Map**  
**9 of 9**



**APPENDIX D**  
**LOCATION HYDRAULIC STUDY FORMS**

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## LOCATION HYDRAULIC STUDY FORM

Dist. 12 Co. OC Rte. 405 P.M. 9.89/11.45  
EA 71621 Bridge No. N/A

Floodplain Description: Gisler Storm Channel

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

Roadway widening may impact flood structures during construction, but will be restored to original state.

2. ADT: Current 307,000 Projected 435,000 (Alt. 3)

3. Hydraulic Data: Base Flood  $Q_{100} =$  Unknown  $\text{ft}^3 / \text{s}$

$WSE_{100} =$  Unknown The flood of record, if greater than  $Q_{100}$ :

$Q =$  Unknown  $\text{ft}^3 / \text{s}$

$WSE =$  Unknown

Overtopping flood  $Q =$  Unknown  $\text{m}^3 / \text{s}$

$WSE =$  Unknown

Are NFIP maps and studies available?

YES X

NO       

4. Is the highway location alternative within a regulatory floodway ?

YES       

NO X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential  $Q_{100}$  backwater damages:

A. Residences?

NO X

YES       

B. Other Bldgs?

NO X

YES       

C. Crops?

NO X

YES       

D. Natural and beneficial floodplain values?

NO X

YES       

6. Type of Traffic:

A. Emergency supply or evacuation route?

NO       

YES X

B. Emergency vehicle access?

NO       

YES X

C. Practicable detour available?

NO X

YES       

D. School bus or mail route?

NO X

YES       

7. Estimated duration of traffic interruption for 100-year event hours: 0

8. Estimated value of  $Q_{100}$  flood damages (if any) – moderate risk level.

9	Assessment of Level of Risk	Low	X
		Moderate	
		High	

Signature – Dist. Hydraulic Engineer \_\_\_\_\_ Date \_\_\_\_\_  
(Item numbers 3,4,5,7,9)

NO                      X                      YES

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature – Dist. Project Engineer \_\_\_\_\_ Date \_\_\_\_\_  
(Item numbers 1,2,6,8)

## LOCATION HYDRAULIC STUDY FORM

Dist. 12 Co. OC Rte. 405 P.M. 11.70  
EA 071621 Bridge No. 55 0476

Floodplain Description: Greenville Banning Channel

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

Roadway widening over 3-12x12 RCB, extend existing RCB on upstream side.

2. ADT: Current 307,000 Projected 435,000 (Alt. 3)

3. Hydraulic Data: Base Flood  $Q_{100} =$  3,450  $\text{ft}^3 / \text{s}$

WSE<sub>100</sub> = Unknown The flood of record, if greater than  $Q_{100}$ :

$Q =$  Unknown  $\text{ft}^3 / \text{s}$

WSE = Unknown

Overtopping flood  $Q =$  Unknown  $\text{m}^3 / \text{s}$

WSE = Unknown

Are NFIP maps and studies available?

YES

X

NO

4. Is the highway location alternative within a regulatory floodway ?

YES

NO X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential  $Q_{100}$  backwater damages:

A. Residences?

NO X

YES       

B. Other Bldgs?

NO X

YES       

C. Crops?

NO X

YES       

D. Natural and beneficial floodplain values?

NO X

YES       

6. Type of Traffic:

A. Emergency supply or evacuation route?

NO       

YES X

B. Emergency vehicle access?

NO       

YES X

C. Practicable detour available?

NO X

YES       

D. School bus or mail route?

NO X

YES       

7. Estimated duration of traffic interruption for 100-year event hours: 0

8. Estimated value of  $Q_{100}$  flood damages (if any) – moderate risk level.

9	Assessment of Level of Risk	Low	X
		Moderate	
		High	

Signature – Dist. Hydraulic Engineer \_\_\_\_\_ Date \_\_\_\_\_  
(Item numbers 3,4,5,7,9)

NO                        X                        YES

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113 \_\_\_\_\_

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature – Dist. Project Engineer \_\_\_\_\_ Date \_\_\_\_\_  
(Item numbers 1,2,6,8)

## LOCATION HYDRAULIC STUDY FORM

Dist. 12 Co. OC Rte. 405 P.M. 12.41  
EA 071621 Bridge No. 55 0258  
Floodplain Description: Santa Ana River

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

Bridge widening, pier wall extension, new pier walls for Euclid on-ramp.

2. ADT: Current 307,000 Projected 435,000 (Alt. 3)

3. Hydraulic Data: Base Flood  $Q_{100} =$  47,000  $\text{ft}^3 / \text{s}$   
WSE<sub>100</sub> = Unknown The flood of record, if greater than  $Q_{100}$ :  
 $Q =$  Unknown  $\text{ft}^3 / \text{s}$  WSE = Unknown  
Overtopping flood  $Q =$  Unknown  $\text{m}^3 / \text{s}$  WSE = Unknown  
Are NFIP maps and studies available? YES X NO       

4. Is the highway location alternative within a regulatory floodway ?  
YES X NO       

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential  $Q_{100}$  backwater damages:

A. Residences?	NO <u>X</u>	YES <u>      </u>
B. Other Bldgs?	NO <u>X</u>	YES <u>      </u>
C. Crops?	NO <u>X</u>	YES <u>      </u>
D. Natural and beneficial floodplain values?	NO <u>X</u>	YES <u>      </u>

6. Type of Traffic:

A. Emergency supply or evacuation route?	NO <u>      </u>	YES <u>X</u>
B. Emergency vehicle access?	NO <u>      </u>	YES <u>X</u>
C. Practicable detour available?	NO <u>X</u>	YES <u>      </u>
D. School bus or mail route?	NO <u>X</u>	YES <u>      </u>

7. Estimated duration of traffic interruption for 100-year event hours: 2

8. Estimated value of  $Q_{100}$  flood damages (if any) – moderate risk level.

A.	Roadway	\$	<u>0</u>
B.	Property	\$	<u>0</u>
	Total	\$	<u>0</u>

9      Assessment of Level of Risk      Low      X  
    Moderate      \_\_\_\_\_  
    High      \_\_\_\_\_

For High Risk projects, during design phase, additional Design Study Risk Analysis  
 May be necessary to determine design alternative.

Signature – Dist. Hydraulic Engineer      \_\_\_\_\_ Date      \_\_\_\_\_  
 (Item numbers 3,4,5,7,9)

Is there any longitudinal encroachment, significant encroachment, or any support of  
 incompatible Floodplain development?

   NO      \_\_\_\_\_ YES      X  
 If yes, provide evaluation and discussion of practicability of alternatives in accordance with  
 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic  
 Study shall be retained in the project files.

Signature – Dist. Project Engineer      \_\_\_\_\_ Date      \_\_\_\_\_  
 (Item numbers 1,2,6,8)

## LOCATION HYDRAULIC STUDY FORM

Dist. 12 Co. OC Rte. 405 P.M. 12.87  
EA 071621 Bridge No. N/A  
Floodplain Description: Fountain Valley Channel

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

Roadway widening over 2-10x7 RCB, lengthen culvert, modify inlet and outlet structures.

2. ADT: Current 307,000 Projected 435,000 (Alt. 3)

3. Hydraulic Data: Base Flood  $Q_{100} =$  172  $\text{ft}^3 / \text{s}$

WSE<sub>100</sub> = Unknown The flood of record, if greater than  $Q_{100}$ :

$Q =$  Unknown  $\text{ft}^3 / \text{s}$

WSE = Unknown

Overtopping flood  $Q =$  Unknown  $\text{m}^3 / \text{s}$

WSE = Unknown

Are NFIP maps and studies available?

YES X

NO       

4. Is the highway location alternative within a regulatory floodway ?

YES       

NO X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential  $Q_{100}$  backwater damages:

A. Residences?

NO X

YES       

B. Other Bldgs?

NO X

YES       

C. Crops?

NO X

YES       

D. Natural and beneficial floodplain values?

NO X

YES       

6. Type of Traffic:

A. Emergency supply or evacuation route?

NO       

YES X

B. Emergency vehicle access?

NO       

YES X

C. Practicable detour available?

NO X

YES       

D. School bus or mail route?

NO X

YES       

7. Estimated duration of traffic interruption for 100-year event hours: 2

8. Estimated value of  $Q_{100}$  flood damages (if any) – moderate risk level.

Signature – Dist. Project Engineer \_\_\_\_\_ Date \_\_\_\_\_  
(Item numbers 1,2,6,8)

## LOCATION HYDRAULIC STUDY FORM

Dist. 12 Co. OC Rte. 405 P.M. 14.50/16.98  
EA 071621 Bridge No. 55 0478  
Floodplain Description: Ocean View Channel

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

Roadway widening over 2-12x9.5 RCB, lengthen culvert upstream.

2. ADT: Current 257,000 Projected 352,000 (Alt. 3)

3. Hydraulic Data: Base Flood  $Q_{100} =$  1,930  $\text{ft}^3 / \text{s}$

WSE<sub>100</sub> = Unknown The flood of record, if greater than  $Q_{100}$ :

$Q =$  Unknown  $\text{ft}^3 / \text{s}$

WSE = Unknown

Overtopping flood  $Q =$  Unknown  $\text{m}^3 / \text{s}$  WSE = Unknown

Are NFIP maps and studies available? YES X NO           

4. Is the highway location alternative within a regulatory floodway ?

YES            NO X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential  $Q_{100}$  backwater damages:

A. Residences?	NO <u>X</u>	YES <u>          </u>
B. Other Bldgs?	NO <u>X</u>	YES <u>          </u>
C. Crops?	NO <u>X</u>	YES <u>          </u>
D. Natural and beneficial floodplain values?	NO <u>X</u>	YES <u>          </u>

6. Type of Traffic:

A. Emergency supply or evacuation route?	NO <u>          </u>	YES <u>X</u>
B. Emergency vehicle access?	NO <u>          </u>	YES <u>X</u>
C. Practicable detour available?	NO <u>X</u>	YES <u>          </u>
D. School bus or mail route?	NO <u>X</u>	YES <u>          </u>

7. Estimated duration of traffic interruption for 100-year event hours: 2

8. Estimated value of  $Q_{100}$  flood damages (if any) – moderate risk level.

Signature – Dist. Project Engineer \_\_\_\_\_ Date \_\_\_\_\_  
(Item numbers 1,2,6,8)

## LOCATION HYDRAULIC STUDY FORM

Dist. 12 Co. OC Rte. 405 P.M. 14.50/16.98  
EA 071621 Bridge No. 55 0480

Floodplain Description: East Garden Grove Wintersburg Channel

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

New bridges over channel, new pier wall at center of channel.

2. ADT: Current 257,000 Projected 352,000 (Alt. 3)

3. Hydraulic Data: Base Flood  $Q_{100} =$  5,910  $\text{ft}^3 / \text{s}$

WSE<sub>100</sub> = Unknown The flood of record, if greater than  $Q_{100}$ :

$Q =$  Unknown  $\text{ft}^3 / \text{s}$

WSE = Unknown

Overtopping flood  $Q =$  Unknown  $\text{m}^3 / \text{s}$

WSE = Unknown

Are NFIP maps and studies available?

YES X

NO       

4. Is the highway location alternative within a regulatory floodway ?

YES       

NO X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential  $Q_{100}$  backwater damages:

A. Residences?

NO X

YES       

B. Other Bldgs?

NO X

YES       

C. Crops?

NO X

YES       

D. Natural and beneficial floodplain values?

NO X

YES       

6. Type of Traffic:

A. Emergency supply or evacuation route?

NO       

YES X

B. Emergency vehicle access?

NO       

YES X

C. Practicable detour available?

NO X

YES       

D. School bus or mail route?

NO X

YES       

7. Estimated duration of traffic interruption for 100-year event hours: 8

8. Estimated value of  $Q_{100}$  flood damages (if any) – moderate risk level.

Signature – Dist. Project Engineer \_\_\_\_\_ Date \_\_\_\_\_  
(Item numbers 1,2,6,8)

## LOCATION HYDRAULIC STUDY FORM

Dist. 12 Co. OC Rte. 405 P.M. 20.56/20.91  
EA 071621 Bridge No. N/A

Floodplain Description: Milan Storm Drain

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

Roadway widening over 4x4 RCB, lengthen RCB.

2. ADT: Current 257,000 Projected 352,000 (Alt. 3)

3. Hydraulic Data: Base Flood  $Q_{100}$ = Unknown  $\text{ft}^3 / \text{s}$

WSE<sub>100</sub>= Unknown The flood of record, if greater than  $Q_{100}$ :

$Q$ = Unknown  $\text{ft}^3 / \text{s}$

WSE= Unknown

Overtopping flood  $Q$ = Unknown  $\text{m}^3 / \text{s}$  WSE= Unknown

Are NFIP maps and studies available? YES X NO       

4. Is the highway location alternative within a regulatory floodway ?

YES        NO X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential  $Q_{100}$  backwater damages:

A. Residences?	NO <u>X</u>	YES <u>      </u>
B. Other Bldgs?	NO <u>X</u>	YES <u>      </u>
C. Crops?	NO <u>X</u>	YES <u>      </u>
D. Natural and beneficial floodplain values?	NO <u>X</u>	YES <u>      </u>

6. Type of Traffic:

A. Emergency supply or evacuation route?	NO <u>      </u>	YES <u>X</u>
B. Emergency vehicle access?	NO <u>      </u>	YES <u>X</u>
C. Practicable detour available?	NO <u>X</u>	YES <u>      </u>
D. School bus or mail route?	NO <u>X</u>	YES <u>      </u>

7. Estimated duration of traffic interruption for 100-year event hours: 0

8. Estimated value of  $Q_{100}$  flood damages (if any) – moderate risk level.

Signature – Dist. Project Engineer \_\_\_\_\_ Date \_\_\_\_\_  
(Item numbers 1,2,6,8)

## LOCATION HYDRAULIC STUDY FORM

Dist. 12 Co. OC Rte. 405 P.M. 23.08  
EA 071621 Bridge No. N/A  
Floodplain Description: Bixby Storm Channel

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

Roadway widening, new bypass channel.

2. ADT: Current 370,000 Projected 512,000 (Alt. 3)

3. Hydraulic Data: Base Flood  $Q_{100} =$  203  $\text{ft}^3 / \text{s}$   
 $WSE_{100} =$  Unknown The flood of record, if greater than  $Q_{100}$ :  
 $Q =$  Unknown  $\text{ft}^3 / \text{s}$   $WSE =$  Unknown  
Overtopping flood  $Q =$  Unknown  $\text{m}^3 / \text{s}$   $WSE =$  Unknown  
Are NFIP maps and studies available? YES X NO       

4. Is the highway location alternative within a regulatory floodway ?  
YES        NO X

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential  $Q_{100}$  backwater damages:

A. Residences?	NO <u>X</u>	YES <u>      </u>
B. Other Bldgs?	NO <u>X</u>	YES <u>      </u>
C. Crops?	NO <u>X</u>	YES <u>      </u>
D. Natural and beneficial floodplain values?	NO <u>X</u>	YES <u>      </u>

6. Type of Traffic:

A. Emergency supply or evacuation route?	NO <u>      </u>	YES <u>X</u>
B. Emergency vehicle access?	NO <u>      </u>	YES <u>X</u>
C. Practicable detour available?	NO <u>X</u>	YES <u>      </u>
D. School bus or mail route?	NO <u>X</u>	YES <u>      </u>

7. Estimated duration of traffic interruption for 100-year event hours: 8

8. Estimated value of  $Q_{100}$  flood damages (if any) – moderate risk level.

9	Assessment of Level of Risk	Low	X
		Moderate	
		High	

Signature – Dist. Hydraulic Engineer \_\_\_\_\_ Date \_\_\_\_\_  
(Item numbers 3,4,5,7,9)

NO                      X                      YES

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature – Dist. Project Engineer \_\_\_\_\_ Date \_\_\_\_\_  
(Item numbers 1,2,6,8)